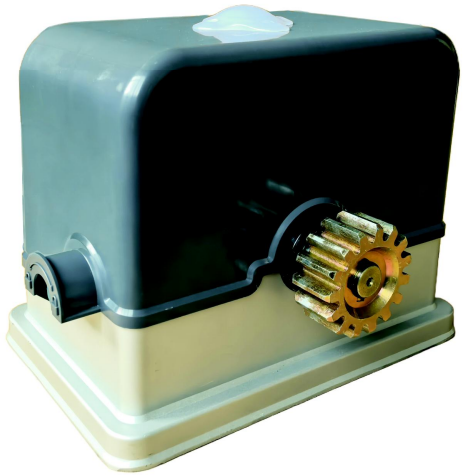
DC Brushless Planetary Gear Sliding Gate Operator

Manual

(For PYMBL-A Controller)



V1.0.0

Preface

Symbol Stipulations

The meanings of the following symbols which may appear in this manual.

Symbols	Meanings
DANGER	Indicates that there is a high level of potential danger, if not avoided, it may cause casualties or serious injures.
WARNING	Indicates that there is a medium or low level of potential danger. If not avoided, it may cause minor or moderate injury to personnel.
ATTENTION	Indicates potential risks. If you ignore the information, it may cause equipment damage, data loss, equipment performance degradation, or unpredictable results.
TIPS	Indicates that it can help you solve a problem or save your time.
EXPLANATION	Indicates that it is the additional information of the main text, which emphasizes and supplements the main text.

Revision History

Version No.	Revision Content	Release Date
V1.0.0	First Release.	2025.07

Safety Instructions

The following is the correct methods of using the product, in order to prevent danger, prevent property damage, etc., please read this manual carefully before using the equipment and strictly follow it during use. Please keep the manual properly after reading.

Operating Environment Requirements

Please transport, use and store the device within the allowable humidity and temperature range.

Please do not let any liquid flow into the device.

Please do not press hard, vibrate violently or soak the equipment.

Please use the factory packaging or materials of the same quality when shipping the equipment.

It is recommended to ground via the grounding hole on the device to improve the reliability of the device.

Operation and Maintenance Requirements

Please do not disassemble the device privately.

Please use the accessories or attachments of the manufacturer for installation and maintenance by professional service personnel.

Please do not provide two or more power supply methods to the device at the same time, otherwise the device may be damaged.

Contents

1. Production Overview

1.1. Brief Introduction

This product is a DC brushless sliding gate motor utilizing planetary gear transmission. Adopting a brand new design concept, this motor combines a planetary gear system with higher transmission efficiency and a DC brushless motor, resulting in lower energy consumption. It abandons traditional mechanical limit switches and instead employs position learning combined with sliding stroke memory for limit setting, thereby reducing the failure rate. An innovative electronic clutch switch ensures simple operation. The remote controllers employs rolling code encryption technology to prevent copying, significantly enhancing security.

1.2. Functions and Features

1.2.1. Driven by a DC 24V brushless motor, and the opening and closing speed is adjustable (5~15m/min).

1.2.2. The efficient planetary gear transmission mechanism ensures energy savings and reliability.

1.2.3. It supports full-voltage input from 100VAC to 265VAC, meeting usage requirements in regions worldwide.

1.2.4. The rolling code encryption remote control technology prevents copying, safeguarding security.

1.2.5. Built-in control board, no need complex wiring when installing, just connect the power supply.

1.2.6. Equipped with electronic clutch, release the electronic clutch to manually open or close the gate when power-off.

1.2.7. Soft start/stop, no mechanical limit switch, automatic limit learning for greater precision and smoother motor operation.

1.2.8. It can be connected with access control system, push button switch, infrared photocell and so on.

1.2.9. It can be connected to the battery or solar battery operation, and battery backup charging module is optional.

1.2.10. With self-locking function when power-off, auto-aging test, and counting function (need to work with loop detector or infrared photocell).

1.2.11. With auto-reversing on obstruction when closing and stopping on obstruction when opening function.

1.2.12. With opening/closing deceleration in advance and limit self-locking function.

1.2.13. With delay auto-closing function, and the delay auto-closing time is adjustable (0~255 seconds).

1.2.14. The motor can be operated and controlled by mobile phone APP to open, close or stop (APP to be developed).

1.3. Technical Data

1.3.1. Working temperature (motor): -35℃~ + 70℃

1.3.2. Power supply input voltage: AC100~265V

1.3.3. Controller input voltage: DC24V±10%, 10A

1.3.4. Motor power: 180W

1.3.5. Relative humidity: 30%~80% (no condensation)

1.3.6. Distance of remote controller: open and undisturbed, L≤50M

1.3.7. Output speed: 100r/min

1.3.8. Running speed: 15m/min

1.3.9. Max weight of gate: 1000KG

2. Product Structure

2.1. Product Dimensions

Figure 2-1 Product Dimensions

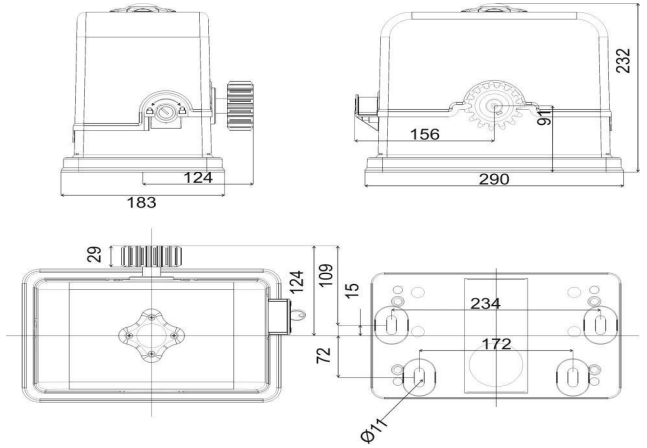
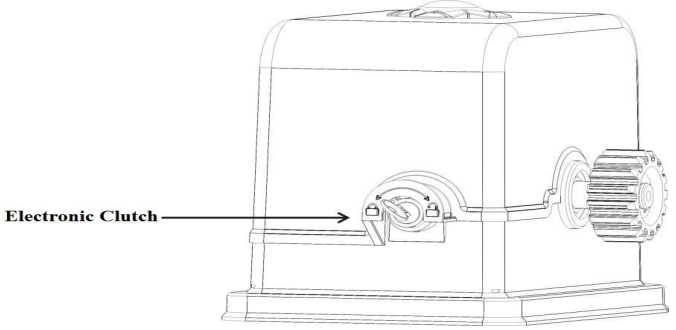


Figure 2-2 Product Appearance



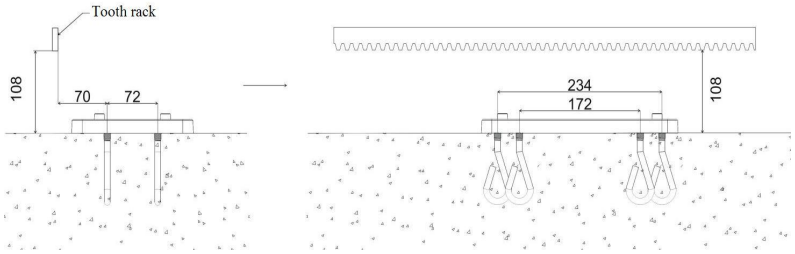
EXPLANATION

The function of this electronic clutch is to connect or disconnect the motor power lines. When the key is turned counterclockwise, the motor power lines are connected, causing high resistance in the motor gears, equivalent to closing the clutch, and the key can then be removed. When the key is turned clockwise, the motor power lines are disconnected,reducing the resistance in the motor gears, allowing the gate to be manually pushed, equivalent to opening the clutch, and the key cannot be removed at this time.

3. Product Installation and Adjustment

3.1 Motor Base Installation

Figure 3-1 Motor Base Installation



Set the installation position of the base tray according to the size of the motor and the height of the installation position of the gear rack. Then Embed the bolts in advanced or use the expansion bolts to embed the base into the cement foundation.

If the gear rack has already been installed, fix the motor to the base and turn the electronic clutch with the clutch key to the “Open” position, then make the gear of the motor suit right to the gear rack, then the position of the base can be set. Take off the motor and fix the base.

3.2. Motor Installation

Step 1: Use a cross screwdriver to remove the "decorative light cover fixing screws" and the "waterproof cover fixing screws" in sequence, and remove the waterproof cover upwards.

Step 2: Unplug the "light board wire" and set the waterproof cap aside.

Step 3: Use a 6mm hexagonal wrench to remove the "motor fixing screws" and thread a $3*0.75^2$ power cord through the motor base.

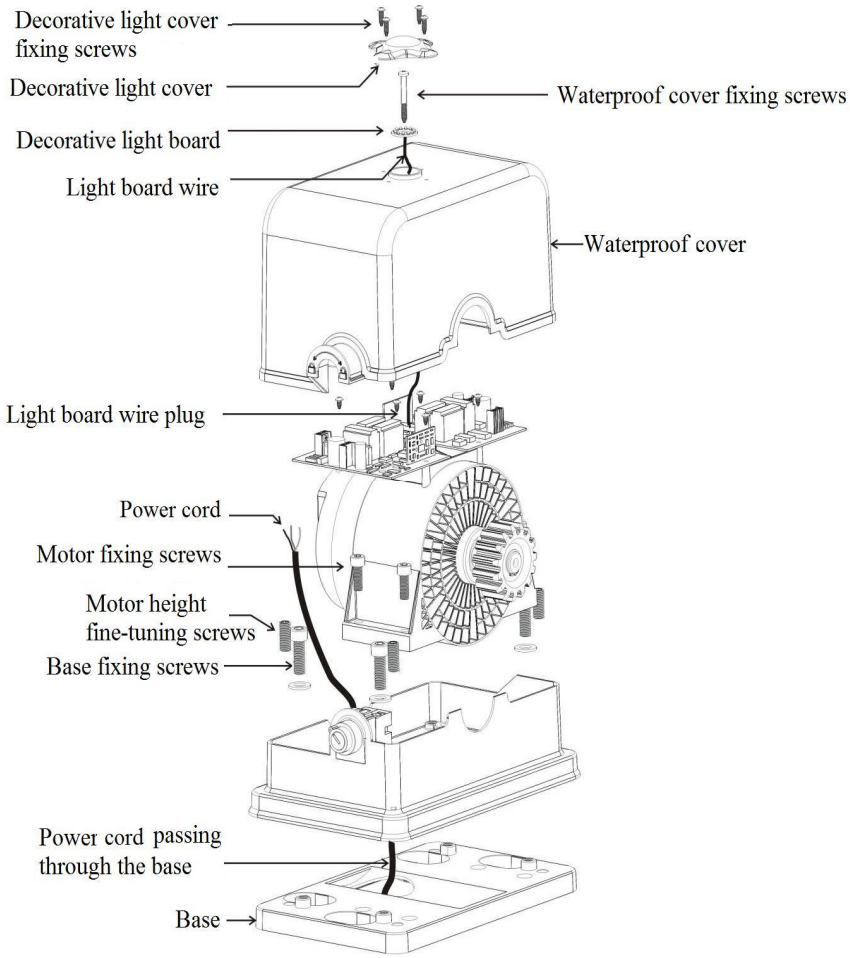
Step 4: Use an hexagonal wrench to fix the base and motor in turn, and adjust the "motor height fine-tuning screws" appropriately to ensure the motor gear meshes with the rack.

Step 5: Connect the power cord to the power input interface of the SMPS board.

ATTENTION

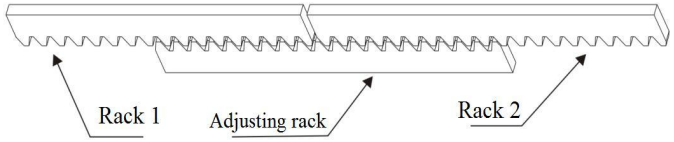
For safety, it is recommended to install an air switch and a leakage protector at the front end of

the power cord. When threading the power cord, ensure that the power cord is not live.



3.3. Gear Rack Installation

Figure 3-3 Tooth Rack



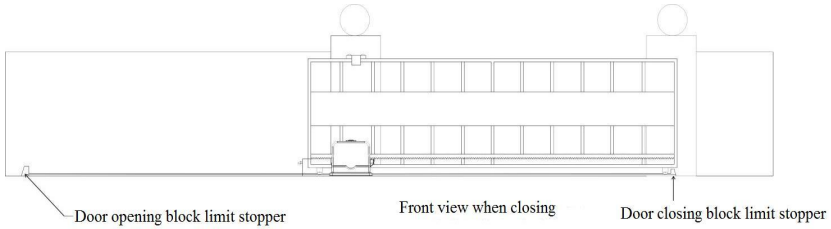
Make the gear of the gear rack towards the floor. Make the gear of the rack fit the gear of the

motor. Fasten the gear rack to the gate with the screws. Push the gate and make it move the whole route. Fasten the gear to the gate after assuring that the gate run smoothly the whole route.

Rack is usually installed piece after piece. To avoid dithering or blocking, please adjust the gap of the gear rack. We suggest one way (refer to Figure 3-3): fix up the rack 1 and rack 2 after adjusting the two racks with the small adjusting rack.

3.4. Block Stopper Installation

Figure 3-4 Front View When Closing



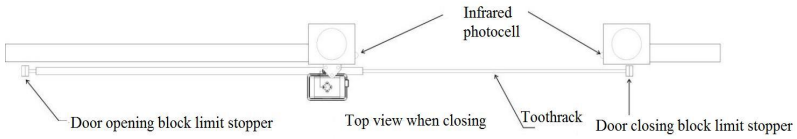
Install a block stopper at both the open limit position and close limit position of the gate. One reason is that when finding running range the first time after power on, the gate will touch the stopper as limit point of the running range. The other reason is to prevent the gate from going off the racks.

EXPLANATION

The block stopper should be installed well when installing the tooth racks.Users can weld a piece of angle iron or use a similar method, to prevent the gate from going off the racks.

3.5. Infrared Photocell Installation

Figure 3-5 Infrared Photocell Installation



The infrared photocell need to be installed on both sides of the gate post, with the receiver installed on the side closer to the motor and the emitter installed on the other side farther from the motor.

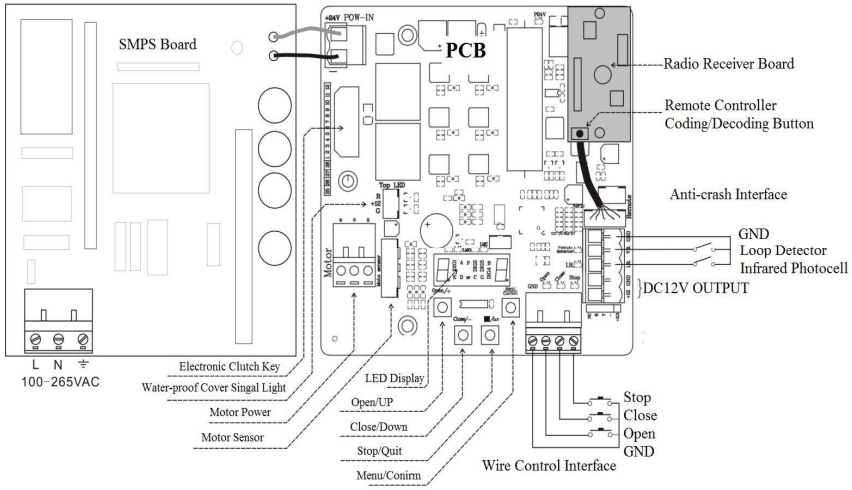
Note: The infrared photocell is an optional accessory.

4. Controller Explanations and Instructions

4.1. Controller Explanations

4.1.1. Controller Wiring Diagram

Figure 4-1 Controller Wiring Diagram



4.1.2. Controller Interface Explanations

Interface/Signal Light/Push Button	Explanation
Wire Control Interface	Users can connect an external controller to control the sliding gate operator via this interface. Open: Short circuit "Open" and "GND" Close: Short circuit "Close" and "GND" Stop: Short circuit "Stop" and "GND"
Anti-crash interface	Infrared Photocell: Gate will open when short circuiting "Infrared photocell" and "GND" interfaces during gate closing. If gate at open limit position then it won't react. Loop Detector: Gate will open when short circuiting "loop detector" and "GND" interfaces during gate closing. After opening to the open limit position, the gate will automatically close after the "loop detector" is disconnected from "GND"; when the gate opened to the open limit position, if short-circuit the "loop detector" and "GND" interfaces, the gate will automatically close after they are disconnected.
DC12V Output Power	Provide 1A current output, available for infrared photocell

Interface/Signal Light/Push Button	Explanation
Function Buttons	There are two working status for these four buttons: normal working state and menu setting state. In the normal working state, the **"Open/+"** button means opening, the **"Close/-"** button means closing, the**"■/QUIT"** button means stop. The **"Menu/Confirm"** button has no function when short-pressed during normal working state, long-pressing it for 2 seconds to enter the menu setting state. In the menu setting state, push the **"Open/+"** and **"Close/-"** buttons to increase or decrease the value of menu items or parameters. The **"■/QUIT"** button means cancel the set value or exits the menu setting state. Push the **"Menu/Confirm"** button to enter the next level menu or save the set value.
LED Display Tube	It can be used for displaying the working status, parameters, menu items, and other information of the sliding gate operator.

4.2. Meaning of Information Displayed on Digital Tube

Content	Meaning
STOP	Stop state
LocK	Long pressed the remote controller button for 4 seconds to enter motorcade passing mode. Press the remote controller gate closing button to release it.
uPxx	The number of times of open gate when the counting function is enabled (displayed only when the counting function is enabled).
dxxx	Automatically delays the closing time，xx represents the countdown time (displayed only when the delay function is enabled).
Pyxx	Software version, xx represents the version number. The larger the value, the higher the version. First displayed when powered on.
uLxx	Displays the voltage of the current power interface, xx represents the voltage value. Displayed when powered on.
oP.xx	In the open process or open position, xx indicates the source of the open signal: 1 remote controller; 6 wire control open/ open button on the control board.
Value	Display the current travel distance during the opening or closing process.

4.3. Controller Parameter Setting

Press and hold the "Menu/Confirm" button for 2 seconds to enter the menu settings mode, the digital display will show "P-XX". Select menu items by short or long pressing the "Open/+" and "Close/-" buttons. Short press once to add or subtract one, and long press continuously to add or subtract. When the "P-XX" item displayed on the digital display is the parameter that needs to be set, press the "Menu/Confirm" again to enter the setting of the specified item, and press the"■/QUIT" to return to the previous level or exit the setting. After setting the specified parameters, you must press the "Menu/Confirm" to confirm before it can take effect. The parameters currently set by pressing the "■/QUIT" will not take effect.

4.3.1 Menu Command List

Menu	Function	Defaults	Range	Remarks
P-00	Gate opening speed	90	50-100	The larger the value, the faster the gate opening speed.
P-01	Gate closing speed	90	50-100	The larger the value, the faster the gate closing speed.
P-02	The distance of deceleration in advance when opening the gate	10	10-80	The distance of deceleration, unit: cm
P-03	The distance of deceleration in advance when closing the gate	10	10-80	The distance of deceleration, unit: cm
P-04	Opening end speed	15	10-30	Gate opening in place speed. When the gate is light, you can reduce the value appropriately to make it open more smoothly. If the gate is heavy, increase the value appropriately to ensure smooth opening and prevent gate from stopping when encountering obstacles.
P-05	Closing end speed	15	10-30	Gate closing in place speed. When the gate is light, you can reduce the value appropriately to make it close more smoothly. If the gate is heavy, increase the value appropriately to ensure smooth closing and prevent the gate from reversing when encountering obstacles.
P-06	The sensitivity of reversing on obstacle	3	0-6	0: The lowest sensitivity. 1-6: The smaller the value, the higher the sensitivity. If there is an error during the gate closing process and the gate cannot be closed due to obstruction, the value can be increased appropriately.
P-07	Obstruction response time	2	1-10	Obstruction response time. Unit: 0.05s. When P-06 set 0, but still experiences reverse on obstacle, the value can be appropriately increased to continue reducing sensitivity.
P-08	Motor rotation direction	3	2-3	Motor rotation direction. 2: forward rotation, 3: reverse rotation. When the remote controller button press the opposite direction to the gate moving direction, this value can be modified.
P-09	Searches for zero point	2	1-2	1: Towards the opening direction, 2:

	direction for the first time when powered on (Zero point position is the position where the gate is mechanically blocked)			towards the closing direction Suggest using the direction where the gate moves smoothly as the direction to find the zero point. When selecting 1, press the open button on the remote controller, the gate will automatically open to the blocking position and then automatically close to the blocking position; If you choose 2, press the close button on the remote controller, the gate will automatically close to the blocking position and then automatically open to the blocking position. The control board displays and records the travel length, and automatically modifies the value of P-11.
P-10	Powered on to search for the zero position speed	25	15-50	According this speed to find the zero position. The larger the value, the faster the speed. When the gate is heavy, the value can be increased appropriately to smoothly move to the blocking position. If the value is too large, it will also increase the force of the gate hitting the blocking position, and should be adjusted appropriately. The principle is that as long as the gate can smoothly move to the blocking position, the smaller the value, the better.
P-11	Travel length	200	50-9999	Length between opening and closing in place. Unit: cm Automatically learn the length by pressing the button in the P-09 menu, or manually measure the length and directly modify the value.
P-12	Delay auto-closing time	0	0-255	0: Close; 1-255: Open delay. Unit: seconds. When opening, the countdown starts when the gate is in place, and the gate automatically closes after the countdown ends. Pressing the remote stop button during the countdown process can pause this delay.
P-13	Delay closing time after passing through	0	0-255	Equipped with a loop detector, the delayed closing gate after passing through the loop detector. 0: close,

				1-255: open delay, unit:s. Tip: When the infrared sensor is connected to the loop detector interface, triggering the infrared sensor can also achieve a similar effect.
P-14	Counting function	0	0-10	Equipped with a loop detector, the gate will only automatically close when the number of times it is opened matches the number of times it passes through the loop detector. 0: Close, 1-10: The max memory count. Tip: When the infrared sensor is connected to the loop detector interface, triggering the infrared sensor can also achieve a similar effect.
P-15	Loop detector Buzzer beeps for prompt sound	1	0-1	Equipped with loop detector, 0: does not sound, 1:sound. Tip: When the infrared sensor is connected to the loop detector interface, triggering the infrared sensor can also achieve a similar effect.
P-16	Loop detector signal effective time	5	1-100	Equipped with loop detector, the loop detector signal is considered effective only if it continues for more than the set time, unit: 0.02 seconds
P-17	Pause delayed closing after reversing on obstacle	1	0-1	0: Cancel delayed closing, 1: Continue delayed closing
P-18	Wire controlled normally open/normally closed	1	0-1	Specifically refers to the three input signals of "Stop", "Infrared sensor", and "Loop detector". 0: normally closed, 1: normally open
P-19	The time of automatic opening gate when low voltage	0	0-50	unit: 0.1 s, 0 is closed. This function requires the installation of a super capacitor
P-20	Automatic opening threshold when low voltage	21	15-22	Action voltage, unit: V.
P-21	Reserve			
P-22	Automatic aging test and automatic closing when power on	0	0-6	0 is normal operation; 1-5 is the time interval for automatic aging test; 6 is the automatic closing when power on
P-23	Reverse			
P-24	Restore default settings	0	0-255	10: Restore default settings
P-25	Program version			Displays the current program version

4.4 Controller Adjustment

After the installation of the motor and gate body, rotate the key electronic clutch counterclockwise to the "locked" position, turn on the power, and the digital tube of the controller will light up. When installing for the first time, it is necessary to learn or set the position and travel of the controller in order to use it normally. The following describes two debugging methods.

Method 1: Automatic length learning

Step 1: Long press the "Menu/Confirm" for 2 seconds to enter the P menu.

Step 2. Press "Open/+" and choose "P-09", then press "Menu/Confirm", the digital display will default to the value of "2".

EXPLANATION

It can also be set to "1". For details, please refer to the description of "P-09" in the "Menu Command Table". The following steps take setting "2" as an example.

Step 3: Press the key button on the remote controller, and the gate will automatically move slowly towards the closing direction until it reaches the blocking position. Then, it will automatically move towards the opening direction until it reaches the blocking position and stops automatically. The travel learning is completed, and the "■/QUIT" button will exit.

EXPLANATION

If the actual direction of movement of the gate body is opposite to the description, press the "■/QUIT" key to stop, modify the value of "P-08" according to the description in the "Menu Command Table", and then return to "P-09" to operate again.

Step 4: Press the "Open" and "Close" buttons on the remote controller to control the opening and closing of the gate, and confirm that both the gate opening and closing are normal.

Method 2: Manually set the travel distance

Step 1: Estimate or measure with a tape measure the distance the gate moves from the closed position to open position, i.e., the travel distance.

Step 2: Long press the "Menu/Confirm" for 2 seconds to enter the P menu.

Step 3: Press the "Open/+", select "P-11", then press "Menu/Confirm", at this time, digital display shows the travel length, unit: cm. Press the "Open/+" or "Close/-", change this value to the estimated or measured, press the "Menu/Confirm" to confirm, then press the "■/QUIT" to exit.

Step 4: Press the "Open" and "Close" on the remote controller respectively, and the gate body will move slowly to the stop position, then you can open and close the gate at normal speed.

EXPLANATION

1.If the actual moving direction of the gate body is opposite to the remote controller key, modify the value of "P-08" according to description in "Menu Command List" and then re-operate.

2.If the gate does not move completely in place when opening or closing at normal speed, the travel value of "P-11" can be appropriately increased.

3.If the gate will collide with the stop block when opening or closing at normal speed, the travel value "P-11" can be appropriately reduced.

After the gate body can be normally open and close, the waterproof cover can be re-installed.

The steps are reverse of the removal steps, first plug in the light board wire, cover the waterproof cover, tighten the waterproof cover fixing screws, and install the decorative light cover and screws.

4.5. Flashing Mode Description of Top Decorative Light

In addition to being decorative, the decorative lights can also flash in different ways to indicate the controller working status. The flashing modes of the decorative lights in different working states of the controller are explained as follows:

Controller Status	Decorative Light Flashing Mode
Gate opened fully	Green light breathing (Sometimes dark, sometimes bright)
Gate opening	Green light flashing
Gate closed fully	Red light breathing (Sometimes dark, sometimes bright)
Gate closing	Red light flashing
Intermediate stop	Yellow light breathing (Sometimes dark, sometimes bright)

4.6. Remote Controller Adding and Deleting

ATTENTION

Must exit pairing mode, the remote controller can be controlled normally.

Increase remote control: Press the small button on the remote control receiver, the blue indicator light will illuminate, entering pairing mode. Press any button on the remote controller, the blue indicator will flash several times and then turn on always, indicating successful pairing. Press any button on a second remote controller within 15 seconds to add another remote controller. Add up to 20 remote controllers. After adding all remote controllers, the blue indicator will turn off after 15 seconds, exit pairing mode.

Decrease remote control: Press and hold the small button on the receiver, the blue indicator light will illuminate and then turn off after 2 seconds, indicating that all remote controllers have been deleted successfully.

5. Maintenance

5.1. Maintenance

1. The antifreeze lubricant oil has been applied to the sliding gate operator. There is no need to add the oil before using.

2. After using the sliding gate operator for some time, please check if any bolts and connecting fasteners are loose. If they turn loose, please tighten them.

5.2. Error Code List

When the control board detects an abnormality, it will display an error code to indicate the error type. The details are as follows:

Error Code	Error Reason
IdLE	The related plug of the motor is not connected, or the motor sensor is faulty, or the wiring is loose.

Er.ob	Auto-reversing or stop on obstruction.
Er.13	The brake resistor is abnormal.
uLxx flash	xx is the voltage of the voltage interface. When xx is less than 15 or xx is more than 30, indicates voltage abnormal and warning flashes.
Er.L0	Wire control stop signal input is detected when power on. Unplug the wired control terminal to check if the issue is caused by external device.
Er.L1	Wire control closing signal input is detected when power on. Unplug the wire control terminal to check if the issue is caused by external device.
Er.L2	Wire control opening signal input is detected when power on. Unplug the wire control terminal to check if the issue is caused by external device.
Er.L3	Loop detector signal input is detected when power on. Unplug the wire control terminal to check if the issue is caused by external device.
Er.L4	Sensor input is detected when power on. Unplug the wire control terminal to check if the issue is caused by external device.
Er.L5	Remote control stop signal is detected when power on. This can be checked by unplugging the remote control receiver module.
Er.L6	Remote control closing signal is detected when power on. This can be checked by unplugging the remote control receiving module.
Er.L7	Remote control opening signal is detected when power on. This can be checked by unplugging the remote control receiving module.

6. Common Malfunctions and Solutions

6.1. Power ON, press the open or close button on the remote controller, but the gate does not work.

6.1.1. Check whether the release key is closed.

6.1.2. Open the waterproof cover and refer to Figure 4-1 to check whether the "POW-IN" plug, release key plug, motor power line plug, and motor sensor plug are loose. Any loose plug will cause the motor can not work.

6.1.3. If there is an external protection device, such as sensor or loop detector, check whether the external protection device is faulty or in protection mode. Refer to Figure 4-1 to unplug the "anti-smash interface" and try again.

6.2. The gate is opened or closed too slowly for the first time after power on.

6.2.1. This product does not have a mechanical limit switch. When powered on for the first time, it needs to slowly search for the travel zero point. This is normal.

6.3. The gate may hit the stop block when opening or closing it for the first time after powering on.

6.3.1. This product does not have a mechanical limit switch. When powered on for the first time, it needs to slowly search for the travel zero point. The stop block is at zero position. This impact is normal. If the impact sound is loud, refer to Menu Command List and adjust the "P-10" value appropriately.

6.4. The gate automatically opens when it is halfway closed and cannot be closed completely.

6.4.1. Power off, turn the release key to the "Open" position, and manually push and pull the gate to close. Feel whether there is a lot of resistance when closing and opening the gate. If so, you need to find out the source of the resistance.

6.4.2. If there is no significant resistance after checking in the above methods, you can refer to Menu Command List to increase the value of "P-06" or adjust it to 0 directly and try again.

6.5. The gate hits the stop block when closing and automatically open again.

6.5.1. Try learning the travel again according to "4.4 Controller Adjustment", or simply reduce the value of "P-11" by referring to Menu Command List.

6.6. The gate hits the stop block when opening every time.

6.6.1. Try learning the stroke again according to "4.4 Controller Adjustment", or simply reduce the value of "P-11" by referring to Menu Command List.

6.7. The gate open and close normally, but the decorative light on the waterproof cover does not light up.

Refer to Figure 3-2 to check if the connectors on the upper and lower ends of the light board are loose.

6.8. Pressing the buttons on the control board can open and close the gate, but the remote controller cannot.

6.8.1. When pressing the remote control buttons, check whether the indicator light on the remote controller is on. If not, replace the batteries and try again.

6.8.2. Try increase a remote controller according to the instructions in "4.6 Remote Controller Adding and Deleting".

6.9. The control board's digital tube displays IDLE.

6.9.1. Check if the motor sensor plug is not plugged in and plug it in properly.

6.9.2. The motor sensor is faulty and the sensor assembly on the plastic part at the bottom of the motor needs to be replaced.

6.10. When pressing the open or close button, the control board resets, and the indicator light turns off and then on again.

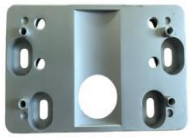
6.10.1. Check if the gate rack is pressing the motor gear.

6.10.2. Turn the release key to the "Open" position, push the gate manually, and feel whether the resistance is too large.

6.10.3. Use multimeter to measure the AC input voltage of the power board during operation. If the voltage drops significantly, it indicates insufficient power.

6.10.4. Use multimeter to measure the DC 24V output voltage of the power board during operation. If the voltage drops significantly, replace the power board.

7. Packing List

Name	Picture	Qty.	Unit	Remark
Sliding Gate Operator		1	Set	
Remote Controller		2	Pcs	Standard 915MHZ
Release Key		2	Pcs	
Base		1	Pcs	
Internal Hex-angular bolt		4	Pcs	M10x30, for fixing the base
Washer		4	Pcs	Φ10
Internal Hex-angular Headless Screws		4	Pcs	M10x25, for adjusting the height of the sliding gate operator
Manual		1	Pcs	
Infrared Photocell		1	Pair	Optional
Radio Emitter		1	Set	Optional